

Specification of UV, Visible, and Infrared Emission Spectra of Sprites and Blue Jets

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Final Report

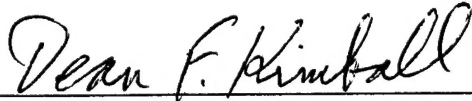
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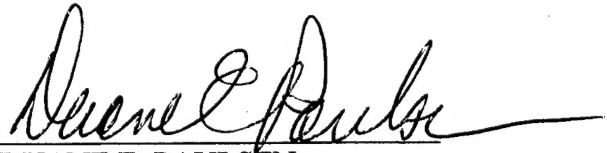
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This technical report has been reviewed and is approved for publication.



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13. ABSTRACT (Maximum 200 words) During the period of performance Stanford University constructed a VLF/ELF receiver to measure the VLF/ELF electromagnetic and quasi-electrostatic fields produced by lightning during Sprite and Blue Jet events, and deployed this instrument in the field to make such measurements. The data acquired in the field was used to characterized the electromagnetic and quasi-electrostatic fields produced by lightning during Sprite and Blue Jet events.				
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SUMMARY

During the period of performance Stanford University constructed a VLF/ELF receiver to measure the VLF/ELF electromagnetic and quasi-electrostatic fields produced by lightning during Sprite and Blue Jet events, and deployed this instrument in the field to make such measurements. The data acquired in the field was used to characterize the electromagnetic and quasi-electrostatic fields produced by lightning during Sprite and Blue jet events.

FINAL TECHNICAL REPORT

1. Contract Purpose

The Contract goal is to measure and interpret ELF/VLF waveforms of causative lightning discharges in order to determine the electromagnetic pulse and quasi-static electric fields which constitute critical inputs to theoretical models of the UV, visible, and infrared emission spectra of Sprites and Blue jets.

2. Period of Performance

The period of performance under this contract extended from May 22, 1996, through May 21, 1998.

3. Work Provided

During the period of performance Stanford University constructed a VLF/ELF receiver to measure the electromagnetic and quasi-electrostatic fields produced by lightning during Sprite and Blue Jet events, and deployed this instrument in the field to make such measurements. The VLF/ELF receiver was constructed, tested and validated during the first year. Field data were acquired during the second year. Analysis and interpretation of the field data was also carried out in the second year.

6. Results

Results of the data analysis was reported in a paper delivered at the December American Geophysical Union in 1998 [Reising *et al.*, 1998] and in a paper published in the journal *Geophysical Research Letters* [Reising *et al.*, 1999]. The complete citations for these papers is given in the Reference section.

7. References

1) Reising, S. C., U. S. Inan, T. F. Bell, Y. Takahashi, and M. Sera, Further evidence of electrical current in Sprites using measurements of ELF radio atmospheric with simultaneous high time-resolution multi-anode array photometer observations. *EOS*, 79, F176, 1998.

2) Reising, S. C., U. S. Inan, and T. F. Bell, ELF spheric energy as a proxy indicator for sprite occurrence, *Geophysical Research Letters*, 26, 987, 1999.

7. List of personnel contributing to report

The list of Stanford University scientists and engineers who contributed to the work reported in this document is as follows:

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Steve Reising

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